

Photograph of the Nebula H I 200 Leonis Minoris.

By Isaac Roberts, D.Sc., F.R.S.

The photograph of the nebula H I 200 *Leonis Minoris*, R.A. $8^h 46^m$, Decl. $33^\circ 49'$ north, was taken on 1893, March 19, with exposure of the plate during three hours. Scale: 1 millimètre = 24 seconds arc.

The nebula is No. 2683 in the *New General Catalogue*, and 1713 in the *General Catalogue*, and is described by Sir J. Herschel as very bright, very large, very much extended in the direction of $40^\circ 9'$, gradually much brighter in the middle.

Lord Rosse, in the *Observations of Nebulae and Clusters of Stars*, p. 70, gives the results of sixteen observations of the nebula made between the years 1851 and 1876. He describes it as a very large lenticular ray, slightly concave on the *n. p.* side, gradually very much brighter in the middle, perhaps $10'$ long, and he suspected the existence of very faint streaks and lanes on each side parallel to the ray.

The photograph shows the nebula with a strong stellar nucleus in the midst of dense nebulosity, which is of a flocculent character, and it is doubtless similar in form to the great nebula in *Andromeda*, but apparently very much smaller in size, and seen more edgewise; the rings are therefore not visible, though their existence is very probable. The nebula measures on the photograph about six and a half minutes of arc in length, and is in a region of the sky which is not exceptionally studded with stars; they are mostly faint, and are shown to about the 16th magnitude.

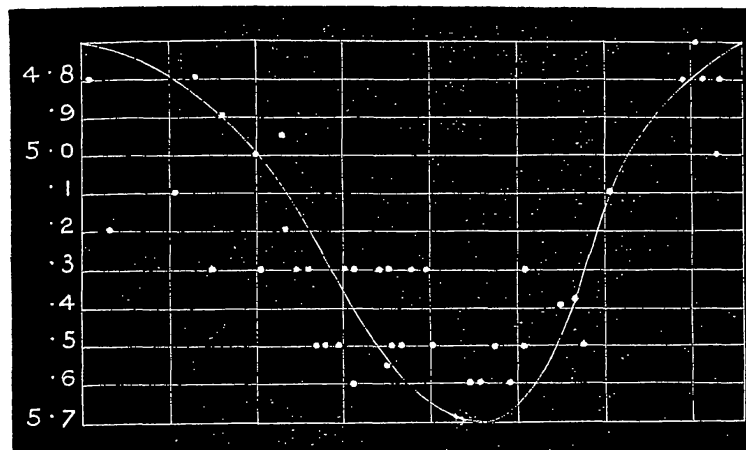
Observations of the Variable Stars W and X Sagittarii.

By Lieut.-Colonel E. E. Markwick.

W Sagittarii.—This star can be easily compared with No. 14 of *Sagittarius* in the *Uranometria Argentina*, 5.4 m., which is well situated for the purpose, as the binocular shows them nicely in the same field. The following observations were made with a binocular magnifying about five times. The observed magnitudes in the *U. A.* scale were plotted on ruled paper, in which the horizontal lines represent brightness, and the vertical ones the dates. The maxima, calculated from the data given in Mr. S. C. Chandler's valuable *Second Catalogue of Variable Stars*, viz. Epoch 1866 September 4 + 7.59460 E, were then marked by ordinates. A typical curve based on the same period and ($M-m$), the interval from minimum to next following maximum, = 3.00 days, was drawn on tracing-paper, and the differences

O—C read off on a scale of equal parts. Finally, the whole of the observations were plotted on the typical curve.

A diagram on these principles is attached. It will be seen that the dots have a curious tendency to range themselves in horizontal lines.



W Sagittarii. Typical Light-curve, with summarised Observations.

This *may* be due to the fact that the determinations of brightness were nearly all in tenths of a magnitude, and hence the dots *must* usually fall on some of the lines. But why they should cluster on the lines 5.4 and 5.6 I cannot say. It might be due either to systematic errors in determining the brightness, or to a real suspension or delay in the diminution of the star's brightness when it arrives near those magnitudes.

According to my estimates, the star varies between 4.8 m. and 5.7 m. Considering the large amount of probable error there is in estimating brightness, the observations seem to confirm the period well enough, those of July 31, August 31, and September 30 falling very close to the maximum lines. The hour of observation is only approximate to within five minutes, and is in G.M.T.

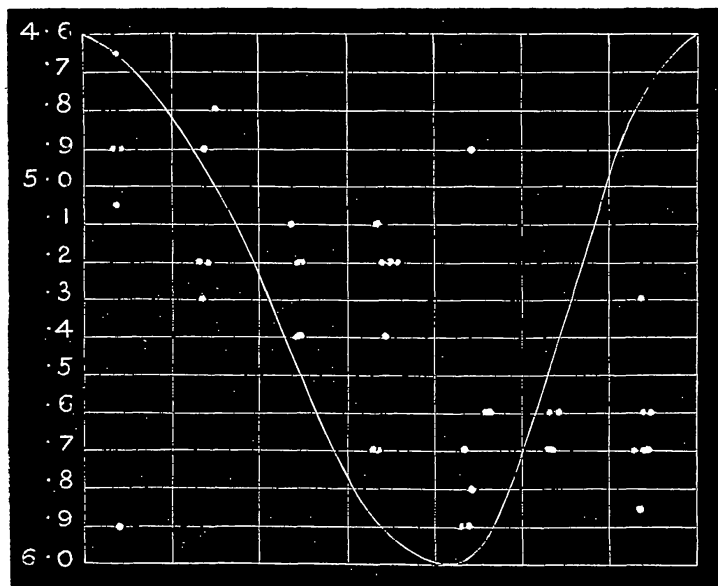
Both in the case of this and the following star I was quite ignorant, when making the observations, as to when the maxima were due, as I had not then calculated the dates, so the observations are free from any bias which such a knowledge might have produced.

W Sagittarii.

Date.		Observed brightness.	O—O <i>d</i>	Remarks.
1893				
July 19	h m 10 41	5.6	—0.3	
20	11 36	5.4	+1.2	
22	10 19	5.6	+0.6	
29	8 40	5.4	—0.7	Moonlight.
31	9 36	4.8	—0.5	Naked eye est.
31	11 35	4.9	+0.2	Binocular.

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Date.		Observed	O-C	Remarks.	
1893.	h m	brightness.	d		
Aug. 3	11 6	5.4	-0.3		
4	9 11	5.4	+0.3		
4	10 6	5.6	-0.1		
5	9 26	5.7	-0.6		
10	9 6	5.1	0.0		
10	10 51	5.4	-0.8		
11	8 46	5.6	-0.4		
11	10 16	5.4	+0.2		
12	9 0	5.6	+0.6		
15	9 21	4.9	-0.1	Clouds about.	
16	9 5	5.3	-2.2		
17	9 36	4.9	+0.3		
18	9 56	5.3	-0.3	Moon.	
20	9 36	5.4	-1.4	Strong Moon.	
27	8 11	5.6	+0.3	Clouds and Moon.	
28	9 9	5.6	-0.8	Moon.	
31	9 6	4.9	+0.7		
Sept. 1	9 14	5.2	-1.2		
3	10 9	5.4	+0.3		
5	9 26	5.6	-0.4	Poor night.	
9	8 32	5.4	-1.3		
10	7 56	5.4	-0.4		
11	7 36	5.4	+0.6		
11	9 6	5.65	0.0		
12	9 11	5.7	-0.6		
13	9 11	5.5	-0.1		
19	8 46	5.4	+1.1	Moonlight.	
20	7 38	5.7	-0.3		
25	8 32	5.05	+0.6		
30	7 21	5.1	+1.0	On and after this date star- getting low and comparison difficult.	
30	8 47	4.9	+0.4		
Oct. 1	8 11	5.2	+2.2		
2	7 35	5.0	0.0		
3	8 46	5.6	-0.6		
6	7 55	5.5	0.0		
11	7 41	5.7	-0.6		
14	7 30	5.2	0.0		

X Sagittarii.—Observations of this star are not satisfactory, as it is difficult, to my eye, to determine its brightness with accuracy. I have generally compared it with *4 Sagittarii*, but when verging towards the west *4* is almost perpendicular above *X*, and atmospheric absorption must then affect the comparison of the two stars, as they are separated by an interval of 5° or so. This applies particularly to observations on and after September 25, which are given for what they are worth. According to my judgment, this star seems to vary between 4.6 and 6.0 mags., or thereabout, in the *U. A.* scale.



X Sagittarii. Typical Light-curve, with summarised Observations.

The maxima of the star, calculated from the period given in Chandler's Catalogue, happen, in 1893, very near midnight, every seven days, beginning, for my observations, on July 25. Hence the observations of July 31, August 15, 28, September 5, 11, 19, and October 2, being close to the maximum point, ought to be high in the scale—certainly above 5 m. But only two of these, viz. August 15 and September 12, show the star above 5.0 m., while those of September 11 and October 3 show it actually of nearly minimum brightness! I can only account for these discrepancies by errors in estimation of the brightness of the star. Curiously enough, the discs in this case when plotted on the curve have a tendency to run in *vertical* groups, as shown in annexed diagram. The observations were made in the same way as those of *W Sagittarii*, and are as follow :—

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X Sagittarii.

Date.		Observed	O-C	Remarks.
1893.	h m	brightness.	d	
July 19	10 36	4.8	+0.5	
20	11 36	5.2	+0.6	
22	10 19	4.9	-1.6	Compared with 14 <i>U.A.</i> <i>Sagittarii.</i>
29	8 40	5.7	-0.6	
31	9 36	5.3	+0.7	Naked-eye view.
31	11 35	5.6	+1.2	
Aug. 3	11 6	5.4	+0.2	
4	9 11	5.4	+1.1	
4	10 6	5.2	+1.5	
5	9 26	5.6	-0.7	
10	10 51	5.2	+0.6	Observation hurried.
11	8 36	5.1	+1.7	
11	10 16	5.2	+1.5	
12	9 0	5.6	-0.7	
15	9 21	4.9	-0.8	
16	9 5	5.3	-0.7	
17	9 36	5.1	+0.7	Clouds.
18	9 56	5.7	+0.6	Moon.
20	9 36	5.7	+0.4	Moon and Clouds about.
28	9 9	5.6	+1.4	Moon.
31	9 6	5.4	+0.1	
Sept. 1	9 31	5.2	+1.5	
3	10 11	5.6	+0.3	
5	9 26	5.05	-1.2	Poor night.
9	8 34	5.8	-0.4	
10	7 56	5.6	+0.2	
11	7 36	5.85	+1.6	
11	9 6	5.7	+1.4	
12	9 11	4.65	0.0	
13	9 11	5.2	-0.5	
19	8 46	4.9	-0.8	Moon.
20	7 38	5.2	-0.6	
25	8 32	5.7	+1.3	Observation vague.
30	7 21	5.9	-0.4	
Oct. 1	8 11	5.7	+0.4	
2	7 37	5.7	+1.3	
3	8 46	5.9	-3.0	
6	7 55	5.7	+0.5	
11	7 41	4.9	+0.1	
14	7 30	5.9	-0.1	

Influence of the Full Moon on the Weather.

By the Rev. S. J. Johnson, M.A.

The theory that the Moon affects the weather has been long exploded, but the solitary observable effect of the Moon upon our atmosphere was believed by Sir J. Herschel to be exhibited in the disappearance of cloud under the full Moon, and this he attributed to the heat radiated from her surface. Humboldt speaks of this idea as well known to the pilots and seamen of Spanish America. M. Arago also spoke of more rain falling at the time of new Moon than at the time of full Moon. With a view of ascertaining whether clouds are more dispersed at the period of full Moon than previously, I have noticed the state of the sky at moonrise and at midnight on the day of full Moon for the past fifteen years, with the result that there is no foundation for the theory referred to.

Column 1 indicates sky similar when full Moon rose and at midnight.
2 = Clearer about midnight than at moonrise.
3 = More overcast about midnight.

Years.	1	2	3
1879	10 times	2 times	1 time
1880	6 "	4 "	2 times
1881	8 "	2 "	2 "
1882	5 "	4 "	4 "
1883	8 "	1 time	3 "
1884	9 "	2 times	1 time
1885	8 "	4 "	1 "
1886	7 "	3 "	2 times
1887	10 "	1 time	2 "
1888	11 "	0 "	1 time
1889	7 "	3 times	2 times
1890	10 "	2 "	1 time
1891	10 "	2 "	0 "
1892	7 "	3 "	2 times
1893	10 "	0 "	3 "
Totals	126	33	27

Melplash Vicarage, Bridport.